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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/711,863

10/11/2004

David C. H. Cheng

14098-US-PA

5862

31561

7590

11/03/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100
ROOSEVELT ROAD, SECTION 2
TAIPEI, 100
TAIWAN

EXAMINER

NORRIS, JEREMY C

ART UNIT

PAPER NUMBER

2841

DATE MAILED: 11/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/711,863

Applicant(s)

CHENG, DAVID C. H.

Examiner

Jeremy C. Norris

Art Unit

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 13-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-9 and 16 is/are allowed.
- 6) ☒ Claim(s) 11, 13-15, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 October 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,354,543 (Lawrence).

Lawrence discloses, a circuit board, comprising: a dielectric layer (col. 3, lines 60-70), having a first surface, a second surface opposite to the first surface and at least one through hole (24B), wherein the through hole passes through the dielectric layer, and an inner diameter of the through hole near the first or the second surface is substantially larger than an inner diameter of the through hole near a middle portion of the through hole (col. 2, lines 65-70); and at least one conductive column (col. 6, lines 1-15), disposed in the through hole, a shape of the conductive column being substantially consistent to a shape of the through hole, wherein the through hole and the conductive column have an hourglass shape (col. 2, lines 65-70) [claim 11].

Additionally, Lawrence discloses, a circuit board, comprising: a dielectric layer (col. 3, lines 60-70), having a first surface and a second surface opposite to the first surface; and a first conductive layer (12B), disposed over the first surface of the dielectric layer, wherein a through hole (24B) is formed in the first dielectric layer and the first conductive layer passing through the dielectric layer and the first conductive

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layer, and an inner diameter of the through hole near the first or the second surface is substantially larger than an inner diameter of the through hole near a middle portion of the through hole (col. 2, lines 65-70); and at least one conductive column (col. 6, lines 1-15), disposed in the through hole, a shape of the conductive column being substantially consistent to a shape of the through hole [claim 13], wherein the through hole and the conductive column have an hourglass shape (col. 2, lines 65-70) [claim 14], further comprising a second conductive layer (16B) disposed over the second surface of the dielectric layer, and wherein the through hole passes through the second conductive layer [claim 15].

Claims 11, 13-15, 17 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,114,240 (Akram).

Akram discloses, referring primarily to figures 2A-F, a circuit board (12), comprising: a dielectric layer (col. 6, lines 1-10), having a first surface (30), a second surface (32) opposite to the first surface and at least one through hole (36), wherein the through hole passes through the dielectric layer, and an inner diameter (D2) of the through hole near the first or the second surface is substantially larger than an inner diameter (D1) of the through hole near a middle portion of the through hole (col. 6, lines 35-50); and at least one conductive column (24), disposed in the through hole, a shape of the conductive column being substantially consistent to a shape of the through hole, wherein the through hole and the conductive column have an hourglass shape (col. 6,

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lines 35-50) [claim 11], wherein the conductive column is a solid column full of the through hole (col. 7, lines 10-15) [claim 17].

Additionally, Akram discloses, a circuit board (12), comprising: a dielectric layer (col. 6, lines 1-10), having a first surface (30) and a second surface (32) opposite to the first surface; and a first conductive layer (24B), disposed over the first surface of the dielectric layer, wherein a through hole (36) is formed in the first dielectric layer and the first conductive layer passing through the dielectric layer and the first conductive layer, and an inner diameter (D2) of the through hole near the first or the second surface is substantially larger than an inner diameter (D1) of the through hole near a middle portion of the through hole (col. 6, lines 35-50); and at least one conductive column (22), disposed in the through hole, a shape of the conductive column being substantially consistent to a shape of the through hole [claim 13], wherein the through hole and the conductive column have an hourglass shape (col. 6, lines 35-50) [claim 14], further comprising a second conductive layer (22B) disposed over the second surface of the dielectric layer, and wherein the through hole passes through the second conductive layer [claim 15], wherein the conductive column is a solid column full of the through hole (col. 7, lines 10-15) [claim 18].

Allowable Subject Matter

Claims 1-9 and 16 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: Claim 1 states the limitation "wherein the conductive material fills with the through hole from a position where the blind ends of the first and second blind holes

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connect with each other and extends towards two ends of the through hole to form a conductive column". This limitation, in conjunction with the other claimed features, was neither found to be disclosed in, nor suggested by the prior art.

Response to Arguments

Applicant's arguments filed 23 August 2006 have been fully considered but they are not persuasive. Applicant alleges, "Lawrence fails to teach 'a conductive column formed in the through hole' and 'a shape of the conductive column formed in the through hole'." However, this allegation is not well taken. Despite Applicants assertions that a thin plating doesn't form a column, it would be well understood by the ordinarily skilled artisan that the plating on the inside of the through hole is indeed a conductive column. Additionally, the column does indeed conform to the shape of the through hole. Thus Applicant's traversal of the rejection on these grounds is deemed unsuccessful. Applicant's arguments with respect to claims 17 and 18 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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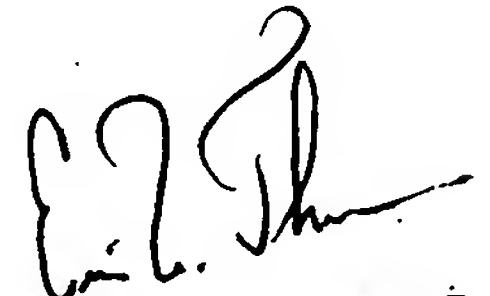
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JCSN


ERIC W. THOMAS
PRIMARY EXAMINER
10.30.06